CASE REPORT

Surgical Treatment of Laryngeal Paralysis in a Cat

D. CAMPBELL AND D. L. HOLMBERG

Department of Veterinary Anesthesiology, Radiology and Surgery, Western College of Veterinary Medicine, University of Saskatchewan, Saskatoon, Saskatchewan S7N 0W0

Summary

A one year old cat, with a history of respiratory dyspnea since it was eight weeks of age, was found to have abnormal function of the larynx. A castellated laryngofissure and bilateral ventriculocordectomy was performed. The respiratory distress was alleviated and the cat's personality changed from being apprehensive and elusive to that of a friendly, social animal. A slight cough remained and a fiberoptic examination four months postoperatively revealed that the right arytenoid drooped medially. Thirteen months after the arytenoid was sutured to the lateral wall of the pharynx, the cat is coughing less frequently and appears to be doing well.

Key words: Cat, dyspnea, laryngeal paralysis, surgery.

Résumé

Traitement chirurgical d'une paralysie du larynx, chez une chatte

Les auteurs ont constaté un fonctionnement anormal du larynx, chez une chatte domestique et âgée d'un an, qui souffrait de dyspnée depuis l'âge de huit semaines. Ils lui firent une fissure crénelée du larynx et lui enlevèrent les cordes vocales. La détresse respiratoire de la patiente s'en trouva soulagée et, de timide qu'elle était, elle devint affectueuse et plus sociable. Une légère toux persista et un examen effectué avec un appareil fibroptique, quatre mois après l'intervention chirurgicale, révéla que le cartilage aryténoïde droit avait subi un léger affaissement médial. Treize mois après la suture du cartilage précité à la paroi latérale du pharynx, la chatte tousse moins souvent et se porte bien.

Mots clés: chatte, dyspnée, paralysie du larynx, chirurgie.

Introduction

There are two forms of laryngeal paralysis in the dog: an idiopathic (acquired) form and a congenital form (2,5-8,10-13). Laryngeal paralysis due to lymphosarcoma involving the vagus nerve is reported in the cat (9). There is also a report of laryngeal paralysis in three mature male cats (4).

The early signs of laryngeal paralysis are: changes in voice, coughing, and gagging while eating or drinking. These are followed by loss of endurance, increased stridor, dyspnea, cyanosis, and syncope if severe (12-14). The onset of signs in the congenital form is three months to three years of age (5). The mean age of onset in the idiopathic form is seven years with a range of two to fourteen years (5).

Surgical techniques to alleviate the signs of laryngeal paralysis are designed to increase the diameter of the upper airway. These techniques are partial laryngectomy by an oral or ventral approach, and unilateral or bilateral arytenoid cartilage lateralization (1,3,5,6,14). Gourley *et al* have reported an alternative method of widening the glottis and subglottis by use of a castellated laryngofissure and vocal cord excision (2). Reliable results were achieved in four dogs. This technique was credited with minimizing the possibility of aspiration pneumonia, which is a complication of the other techniques (5,6,14).

The following case history is a report of the successful use of a castillated laryngofissure for the treatment of congenital laryngeal paralysis in a cat.

History and Clinical Findings

A one year old spayed female, domestic short-hair cat was referred to the Western College of Veterinary Medicine (WCVM) with a history of dyspnea since eight weeks of age. The cat had been timid, resented handling and, when excited, would sit hunched, gasping and wheezing. The cat also coughed frequently when eating. Treatment with steroids and antibiotics had been unsuccessful. During anesthetic induction for a routine ovariohysterectomy, laryngeal dysfunction had been observed and the cat was referred to the WCVM.

The cat appeared thin but healthy during a physical examination. Coughing and gagging could easily be elicited with stress. A routine CBC and thoracic radiographs were normal. Prior to intubation for general anesthesia, the larynx was observed using a laryngoscope. The glottic lumen was small, the vocal cords and aryepiglottic folds were in a paramedian position and laryngeal movements were minimal and out of phase with respiration. A diagnosis of bilateral laryngeal paralysis was made.

Surgical Technique

Procaine penicillin[1] and dexameth-

Reprint requests to Dr. D.L. Holmberg.

[1]Ethacillin, Rogar/STB, London, Ontario, Canada.

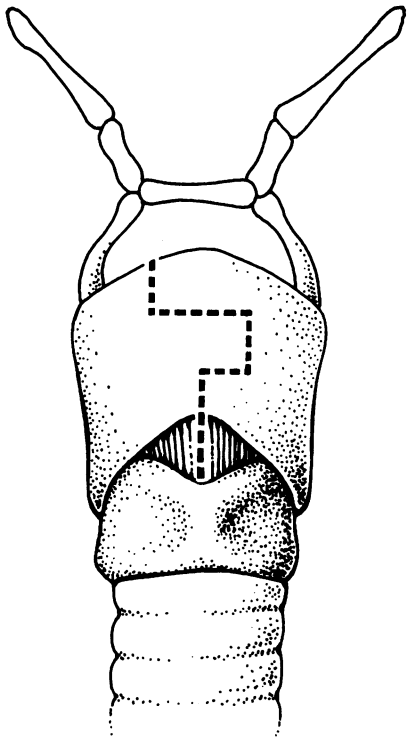

FIGURE 1. The ventral aspect of the larynx. The dotted line represents the proposed laryngotomy incision.

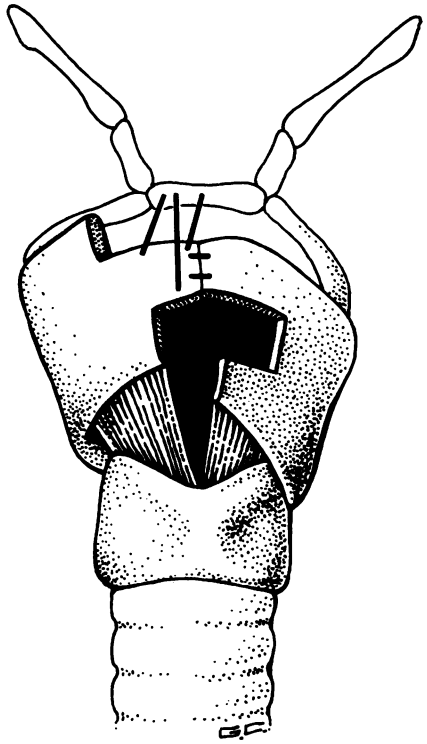

FIGURE 2. The completed castellated incision and alignment of the resulting flaps. Solid lines indicate the placement of sutures in the thyroid cartilage and basihyoid bone.

asone[2] were given intramuscularly prior to surgery. The cat was premedicated with diazepam[3] and atropine,[4] induced with thiamylal[5] and maintained under general anesthesia with halothane,[6] oxygen and nitrous oxide. The cat was placed in dorsal recumbency and a ventral midline incision made over the larynx, thyroid and cricoid cartilage area. A stepped (castellate) incision was made through the thyroid cartilage and cricothyroid ligament (Figure 1). The endotracheal tube was removed and the vocal cords excised. The endotracheal tube was reinserted and the flaps created by the incision were aligned. Full-thickness, 5-0 polyethelene[7] sutures were used to appose the flaps and attach the thyroid cartilage to the basihyoid bone (Figure 2). Soft tissue and skin were closed in a standard fashion. After surgery, there was marked laryngeal edema but extubation was performed without complications and the cat had no difficulty breathing.

Results

No subcutaneous emphysema or infection occurred, and two weeks following surgery the skin sutures were removed. The cat was breathing easily, but had a hoarse purr and occasionally coughed at home. Her personality had completely changed: her apprehensive nature was gone, she was playful, and enjoyed being held and petted.

Four months following surgery, the cat had gained weight and had no problems breathing, but coughed occasionally. Scar formation with ventral webbing was suspected so a fiberoptic examination was performed under light anesthesia. The left arytenoid was seen positioned laterally on inspiration, whereas the right drooped medially, slightly obscuring the laryngeal opening. The right arytenoid and adjacent pharyngeal mucosa were incised and sutured together using a single 6-0 chromic gut suture.[8] Dexamethasone was given intramuscularly since moderate laryngeal edema developed postoperatively. Upon recovery, the cat breathed easily and was released to the owner. Thirteen months after the second procedure, the cat coughs less frequently, but still has a harsh, trill-like purr.

Discussion

In the reported cases of three cats with laryngeal paralysis, all three were between one to two years of age with a history of voice change, absence of purring and progressive dyspnea of one week's duration. One cat had difficulty eating and drinking, and another frequently coughed and gagged (4). These or similar signs were observed in this cat at eight weeks of age, when the owners first obtained possession of the animal. It is presumed that the condition was congenital. Information on siblings is not available.

Definitive diagnosis of laryngeal abductor dysfunction is made by laryngoscopy with the animal in a state of light anesthesia (7,12,13). Laryngeal movements are out of phase with respiration, the glottis becoming narrowed during inspiration by the arytenoid cartilage tipping ventrally and medially. The vocal folds are often flaccid and edematous (12,13). This is similar to that observed with the laryngoscopic examination of this cat.

The corrective surgical procedure performed in a Hardie *et al* report of acquired laryngeal paralysis in three cats was a partial laryngectomy by an oral approach. Recovery was uncom-

[2]Dexagen 5, Rogar/STB, London, Ontario, Canada.
[3]Valium, Roche Laboratories, Nutley, New Jersey, U.S.A.
[4]Atropine sulphate, Glaxo Laboratories, Toronto, Canada.
[5]Biotal, Boehringer Ingelheim (Canada), Ltd., Burlington, Ontario, Canada.
[6]Fluothane, Ayerst, Montreal, Canada.
[7]Dermalene, Davis-Geck, Cyanamid of Canada, Ltd., Montreal, Canada.
[8]Chromic Gut, Davis-Geck, Cyanamid of Canada, Ltd., Montreal, Canada.

plicated and two of the cats were still doing well seven and sixteen months postoperatively (4). No mention was made as to the difficulty of visualization when performing the procedure. The technique of castellated laryngofissure with bilateral ventriculocordectomy worked well to treat the laryngeal paralysis in this cat. The procedure widens the glottic and subglottic area with minimal anatomical changes in the primary protective structures involved with swallowing. This should eliminate or decrease the chances of aspiration pneumonia as a postoperative complication.

The occasional cough observed after the initial surgery was not clinically significant and the cause of the medial drooping of the right arytenoid is unknown. The second anesthesia was given to assist in determining whether excess scar tissue was forming a web across the glottic commissures. The second surgery was an elective attempt to decrease the animal's coughing and was probably not necessary.

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References

1. BAKER GJ. Surgery of the canine pharynx and larynx. J Small Anim Pract 1972; 13: 505-513.
2. GOURLEY IM, PAUL H, GREGORY C. Castellated laryngofissure and vocal fold resection for treatment of laryngeal paralysis in the dog. J Am Vet Med Assoc 1983; 182: 1084-1086.
3. GREENWOOD K, ROSIN E. Bilateral arytenoid cartilage lateralization for laryngeal paralysis in the dog. J Am Vet Med Assoc 1982; 180: 515-518.
4. HARDIE E, KOLATA R, STONE E, STEISS J. Laryngeal paralysis in three cats. J Am Vet Med Assoc 1981; 179: 879-882.
5. HARVEY CE, O'BRIEN JA. Treatment of laryngeal paralysis in dogs by partial laryngectomy. J Am Anim Hosp Assoc 1982; 18: 551.
6. HARVEY CE, VENKER VAN HAAGAN AJ. Surgical management of pharyngeal and laryngeal airway obstruction in the dog. Vet Clin North Am 1975; 5: 515-535.
7. O'BRIEN JA, HARVEY CE. Diseases of the upper airway. In: Ettinger SJ, ed. Textbook of veterinary internal medicine. Philadelphia: WB Saunders Co., 1983: 692-721.
8. REINKE JD, SUTTER PF. Laryngeal paralysis in a dog. J Am Vet Med Assoc 1978; 172: 714-716.
9. SCHAER M, ZAKI FA, HARVEY HJ, O'REILLY WH. Laryngeal hemiplegia due to neoplasia of the vagus nerve in a cat. J Am Vet Med Assoc 1979; 174: 513-514.
10. VENKER VAN HAAGEN AJ. Laryngeal paralysis in young Bouviers. Current Veterinary Therapy VII. Philadelphia: WB Saunders, 1980: 290-291.
11. VENKER VAN HAAGEN AJ, BOUW J, HARTMAN W. Hereditary transmission of laryngeal paralysis in Bouviers. J Am Anim Hosp Assoc 1981; 17: 75-76.
12. VENKER VAN HAAGEN AJ, HARTMAN W, GOEDEGEBUURE SA. Spontaneous laryngeal paralysis in young Bouviers. J Am Anim Hosp Assoc 1978; 14: 714-720.
13. WYKES PM. Canine laryngeal disease, part I: anatomy and disease syndromes. Compend Contin Educ 1983; 5: 8-13.
14. WYKES PM. Canine laryngeal disease, part II: diagnosis and treatment. Compend Contin Educ 1983; 5: 105-110.

ABSTRACTS

HICKEY GJ, WHITE ME, WICKENDEN RP, ARMSTRONG DA. **Effects of oxytocin on placental retention dystocia.** *Veterinary Record* 1984; 114: 189-190 (State Coll. Vet. Med., Cornell Univ., Ithaca, New York 14853, USA).

A double blind randomized clinical trial was performed to assess the effects of oxytocin on the duration of placental retention following dystocia. If the placenta remained attached to the uterus immediately following assisted delivery of a calf, an intramuscular injection of either 3 ml (60 USP units) of oxytocin or 3 ml of 0.9% physiological saline was given to the cow. Each farmer was asked to observe the cow to determine the time of placental expulsion. In 55 cases available for analysis there was no significant difference between the treatment and control groups for percentage of placental retention at days 1, 3 or 3 after parturition.

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POWERS DL, BARB W, VON RECUM AF. **Surgical feasibility of a two-stage prosthetic hip implantation (dog).** *Journal of Veterinary Orthopedics* 1984; 3:35-39 (A.F. von Recum, 301 Rhodes, Clemson Univ., Clemson, South Carolina 29631, USA).

Unilateral coxofemoral hemiarthroplasty was performed in four dogs. A porous intramedullary stem was implanted first, without disrupting the hip joint. After allowing time for bone to grow into the porosity of the stem surface, a second surgical procedure was performed in which the natural femoral head was removed and a prosthetic one fixed to the intramedullary stem. The animals were able to take weight on the limb within 12 hours after both procedures. Good fixation of the femoral stem developed between the first and the second implantation stage, permitting rigid mounting of the prosthetic femoral head during the second surgical procedure.

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